

OCEAN GALES AND STORMS, FEBRUARY 1941—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began, February	Time of lowest barometer, February	Gale ended, February	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
North Atlantic Ocean—Continued													
Bibb, U. S. C. G.	On Station No.2		37 42 N.	46 12 W.	24	2a, 25	26	991.2	S	WSW, 7	NW	WNW, 11	WSW-W.
Exeter, Am. S. S.	Lisbon	Bermuda	35 18 N.	39 42 W.	25	9p, 25	26	993.2	W	W, 8	WNW	WNW, 8	WSW-WNW.
Marques of Comillas, Span. S. S.	do.	Havana	38 06 N.	31 54 W.	26	4a, 26	27	999.9	W	SW, 7	WNW	WNW, 8	SW-W.
Cayuga, U. S. C. G.	On Station No.1		38 36 N.	58 42 W.	26	9p, 26	27	1,004.1	WSW	W, 10	NW	W, 10	W-NW.
Borinquen, Am. S. S.	New York	San Juan	37 00 N.	72 30 W.	28	7a, 28	22	990.5	NE	S, 9	WNW	S, 9	ENE-S-SW.
Gulfhawk, Am. M. S.	Puertola Cruz, Venezuela.	New York	36.28 N.	73 10 W.	28	12m, 28	22	992.2	W	NW, 10	NW	NW, 11	W-NW.
San Gil, Pan. S. S.	Cristobal	Philadelphia	31 30 N.	75 00 W.	28	4p, 28	21	1,005.4	NW	NW, 8	N	NW, 9	
A vessel	Baltimore	Baracoa	33 12 N.	75 06 W.	28	7p, 28	21	1,003.1	NW	NW, 8	NW	NW, 8	
North Pacific Ocean													
Collingsworth, Am. S. S.	Portland, Oreg.	Shanghai	38 36 N.	134 54 E.	30	4p. 30 ³	1	1,001.4	SSW	SSW, 10	NW	NNW, 11	SSW-var.-NNW.
Kyusyu Maru, Jap. M. S.	Yokohama	San Francisco	47 01 N.	157 08 W.	31	6a, 1	3	952.9	SSE	S, 8	SSW	WNW, 8	E-S.
Buenos Aires Maru, Jap. M. S.	do.	Los Angeles	42 52 N.	163 41 W.	1	6a, 1	3	959.7	WSW	W, 9	W	WSW, 9	WSW-W.
Mauna Ala, Am. S. S.	Seattle	Honolulu	45 27 N.	130 51 W.	2	1p, 3	3	985.1	E	S, 10	SSW	S, 10	SSE-SW.
Chirikof, U. S. A. T.	Ketchikan	San Francisco	46 36 N.	129 30 W.	2	3p, 3	3	991.5	SSE	SE, 9	S	SSE, 10	
Waipio, Am. S. S.	Hilo	Grays Harbor, Wash.	38 42 N.	134 54 W.	2	3p, 3	3	992.9	SSW	SSE, 5	S	S, 8	S-SE.
Mauna Loa, Am. S. S.	do.	San Francisco	28 48 N.	141 54 W.	3	4a, 4	5	998.6	SSW	NW, 7	NW	NW, 8	SW-NW-WNW.
Makiki, Am. S. S.	do.	do.	34 00 N.	132 00 W.	5	5a, 5	5	993.2	WNW	WNW, 8	WNW	WNW, 10	None.
Arctic, U. S. S.	San Francisco	Honolulu	34 30 N.	129 00 W.	4	9a, 5	5	995.9	SSE	SW, 8	SW	W, 9	S-SW.
Maliko, Am. S. S.	do.	do.	36 20 N.	125 45 W.	5	3p, 5	6	993.2	SE	SE, 8	SE	SE, 9	SE-WSW.
Huguenot, Am. S. S.	Los Angeles	Seattle	40 10 N.	124 48 W.	5	4p, 5	5	996.3	SE	SE, 9	SE	SE, 9	None.
Chirikof, U. S. A. T.	Ketchikan	San Francisco	41 53 N.	126 07 W.	5	8p, 5	5	991.9	SE	SE, 9	SE	SE, 10	
Arctic, U. S. S.	San Francisco	Honolulu	33 00 N.	131 54 W.	6	11a, 6	7	1,004.4	SSW	WSW, 7	SW	SW, 8	SSW-WSW.
Maliko, Am. S. S.	do.	do.	34 12 N.	134 00 W.	7	3a, 7	7	1,003.1	WSW	SSW, 6	SW	SW, 9	SSW-WSW.
West Kyska, Am. S. S.	Longview	Los Angeles	44 42 N.	124 24 W.	8	10a, 8	8	1,007.8	ESE	ESE, 7	SSE	ESE, 8	Steady.
Collingsworth, Am. S. S.	Shanghai	Hong Kong	22 24 N.	115 12 E.	8	8a, 9	9	1,016.9	NNE	ENE, 6	ENE	NNE, 8	NNE-ENE.
Maliko, Am. S. S.	San Francisco	Honolulu	31 12 N.	139 00 W.	9	9p, 8	9	1,007.5	SW	SSW, 5	W	W, 8	SSW-WSW.
West Kyska, Am. S. S.	Longview	Los Angeles	42 54 N.	124 36 W.	9	5a, 9	9	995.6	SSE	SSE, 10	WSW	SSE, 10	SSE-WSW.
Winkler, Pan. M. S.	San Francisco	Yokohama	30 37 N.	161 10 E.	8	6a, 9	9	1,002.4	ESE	SE, 8	NNW	W, 9	SE-SSW-NNW.
Mindanao, Phil. S. S.	Manila	Los Angeles	31 12 N.	164 30 E.	9	2p, 9	9	1,002.0	S	SSW, 5	SSW	S, 8	SSW-NW.
Nemaha, Am. S. S.	Los Angeles	Osaka	29 18 N.	170 00 E.	9	9p, 9	9	1,003.8	SSE	S, 9	S	S, 9	S-W.
Winkler, Pan. M. S.	San Francisco	Yokohama	31 36 N.	153 48 E.	10	4a, 11	11	1,009.5	SSE	WSW, 7	N	NW, 8	S-NW.
West Kyska, Am. S. S.	Longview	Los Angeles	37 18 N.	122 24 W.	10	9a, 11	11	988.8	SE	SW, 8	WSW	SSE, 10	NE-SW.
Collingsworth, Am. S. S.	Hong Kong	Manila	19 24 N.	116 24 E.	11	8p, 11	12	1,014.6	NE	NE, 7	W	ENE, 8	
Capillo, Am. S. S.	Dahian, P. I.	Honolulu	43 06 N.	171 42 W.	11	6a, 12	14	984.4	SW	ENE, 5	SSW	S, 9	ENE-NNW.
Nitsei Maru, Jap. M. S.	Konmon, Japan	Los Angeles	46 51 N.	173 25 W.	13	12m, 13	13	970.2	SE	S, 9	SW	S, 9	SSE-SSW.
California Standard, Pan. M. S.	Estero Bay	Yokohama	34 58 N.	178 35 E.	12	12m, 12	13	999.3	S	W, 8	W	W, 10	WSW-W.
Do	do.	do.	35 04 N.	174 50 E.	13	6a, 14	15	994.2	SW	SSW, 10	W	SSW, 10	SW-SSW-W.
Kamakura Maru, Jap. M. S.	San Francisco	Honolulu	28 36 N.	145 48 W.	16	2p, 16	17	1,011.9	NW	W, 7	NW	NW, 8	WSW-WNW.
do.	do.	do.	29 42 N.	142 36 W.	16	3a, 17	17	999.7	W	W, 8	NW	W, 9	
Matsonia, Am. S. S.	Pearl Harbor	San Diego	27 00 N.	138 30 W.	17	3p, 17	17	1,006.8	S	WNW, 8	W	WNW, 8	WNW-NW.
Neches, U. S. S.	Yokohama	San Francisco	35 00 N.	151 42 E.	20	2a, 21	21	998.6	SSE	SSW, 8	NW	S, 9	S-SW.
Winkler, Pan. M. S.	Portland, Oreg.	Honolulu	35 00 N.	143 18 W.	21	8p, 21	21	1,007.1	S	S, 8	WNW	S, 8	S-WNW.
Waipio, Am. S. S.	Seattle	Sitka	54 36 N.	130 42 W.	23	4p, 23	23	1,010.5	E	N, 9	N	N, 9	E-N.
North Sea, Am. S. S.	Los Angeles	Pearl Harbor	27 42 N.	141 57 W.	26	7p, 26	27	1,000.3	SW	WNW, 11	NW	WNW, 11	W-WNW.
Porter, U. S. S.	Aberdeen, Wash.	Honolulu	31 24 N.	147 12 W.	26	2p, 26	27	1,001.0	WNW	WNW, 8	NW	WNW, 8	W-WNW.
Hamakua, Am. S. S.	do.	do.	31 30 N.	128 48 W.	28	9p, 27	28	1,000.3	NW	W, 6	NW	NW, 8	S-WNW.
Manoa, Am. S. S.	Los Angeles	San Francisco	36 50 N.	125 55 W.	28	11a, 28	28	981.7	SE	SE, 9	WSW	SE, 9	SE-WSW.

¹ Position approximate.² March.³ January.⁴ Barometer uncorrected.

WEATHER ON THE NORTH PACIFIC OCEAN

By WILLIS E. HURD

Atmospheric pressure.—The most interesting pressure feature on the North Pacific Ocean in February 1941 was the almost continuous presence of low barometer off the west coast of the United States. The condition was well reflected by the abnormally low average barometer on the coast itself. The mean at San Francisco, for instance, was 1,012.2 millibars (29.89 inches) which is 7.1 millibars (0.21 inch) below the normal of the month.

In the northern Pacific the Aleutian Low was unusually deep, and at Dutch Harbor the average pressure,

988.7 millibars (29.20 inches), was 13.7 millibars (0.40 inch) below the month's normal. This average is the lowest of record for February at the station since 1927. The lowest barometer reported on ship was 952.9 millibars (28.14 inches), read on the Japanese M. S. *Kyusyu Maru* on the 1st, near 47° N., 157° W. A similarly low reading was made at St. Paul Island on the 11th.

Pressures below normal occurred in all upper Pacific waters, down the American coast to the Tropics, and then westward to Honolulu. From Midway Island westward the barometer was abnormally high, with two anticyclonic crests, one near Midway Island and the other east of China.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, February 1941, at selected stations

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Millibars	Millibars	Millibars		Millibars	
Barrow	1,021.7	+1.7	1,054	21	991	5
Dutch Harbor	988.7	-13.7	1,014	26	954	10
St. Paul	992.5	-11.6	1,019	25	953	11
Kodiak	1,000.9	-2.2	1,021	20	962	1
Juneau	1,010.8	-2.4	1,026	13	980	4
Tatoosh Island	1,011.5	-4.4	1,023	2	992	28
San Francisco	1,012.2	-7.1	1,024	1	990	11
Mazatlan	1,012.8	-0.7	1,015	7, 15	1,009	8
Honolulu	1,016.6	-1.0	1,025	10	1,011	6
Midway Island	1,019.8	+4.2	1,032	8	1,009	2
Guam	1,013.2	+0.3	1,017	12	1,007	7
Manila	1,013.1	+0.9	1,021	2	1,009	28
Hong Kong	1,017.6	-0.4	1,031	1	1,011	20
Naha	1,020.0	+2.4	1,030	1	1,009	23
Titijima	1,018.4	+3.2	1,025	6	1,008	10
Petropavlovsk	998.1	-7.0	1,019	22	980	13

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observations.

Cyclones and gales.—Although pressures were unusually low in northern waters of the Pacific, thus indicating the frequent passage of deep disturbances, only a moderate degree of storminess was evidenced by ships' observations from all central and western waters along the northern routes. The few gales reported in February 1941 from high latitudes far from the coasts were practically confined to the region between longitudes 150° W., and 175° E., to the northward of latitude 40°. These gales, of forces 8-9, occurred on the 1st, 2d, and 11th to 13th.

South of this area the westbound Panamanian tanker *California Standard* met stormy weather on the 7th near 35° N., 166° W., and on the 13th to 14th near 35° N., from the 180th meridian westward to about 170° E. The heaviest gales, force 10, occurred on the 12th and 14th. Between 175° E., and 150° E., midway along the routes from Yokohama toward Midway Island, stormy weather occurred on the 9th to 11th, the 16th and 17th, and on the 20th and 21st. The gales were 8 to 9 in force, and were accompanied by only moderately depressed barometer.

In the extreme northeastern part of the China Sea fresh northeast monsoon gales were reported for the 8th and 11th.

The stormiest part of the ocean was a triangular region between the United States coast and a point at about the 150th meridian, northeast of the Hawaiian Islands. Of the numerous disturbances that affected some part of this area on all days of February except the 23d to 25th, several, particularly early, in the middle of, and very late in the month, caused gales of considerable severity, rising to force 10 locally on the 2d, 3d, 5th, 9th, and 11th, and to force 11 in squalls on the 26th. Off the Washington coast force-10 gales occurred on the 2d and 3d. Close to the Oregon coast fresh to whole gales were encountered by ships on the 5th, 8th, and 9th, and near the California coast, on the 5th, 10th, 11th, and 28th. As the disturbance of the 11th was moving inland, the southbound American S. S. *West Kyska* had a south-southeast gale of force 10 in the early morning, followed a few hours later, a little south of the Golden Gate, by a southwest wind of force 8 and barometer depressed to 988.8 millibars (29.20 inches). The lowest barometer at San Francisco that day was only two-hundredths of an inch higher. In the storm on the 28th, close to the coast, the American S. S. *Maliko*, near 37° N., 126° W., with a southeast gale of force 9, had a barometer as low as 981.7 millibars (28.99 inches).

Most of the storminess of the middle and late periods of the month in California-Hawaiian waters occurred within the general region 25° to 35° N., 135° to 150° W. Here there were mostly fresh gales on the 16th, 17th, 26th, and 27th. On the 26th, however, the U. S. S. *Porter* had squally weather near 28° N., 142° W., with the wind rising at times to force 11.

In the Gulf of Tehuantepec only one norther-type wind, that of the 5th, was reported to have attained a force as high as 7.

Fog.—The open ocean was singularly devoid of fog. In near coastal waters, it was reported on the 1st in Chosen Strait; on the 2d to 5th and the 9th and 10th off the southern coast of California; and on the 11th near the tip of Lower California.

RIVER STAGES AND FLOODS

By BENNETT SWENSON

Precipitation amounts were abnormally high from Oklahoma and Texas westward to the Pacific Ocean, including most of the Great Basin, and river stages were high in most of this area with light to moderate flooding occurring at a few points, notably in Texas, Oklahoma, and California. The outstanding feature was the heavy rainfall in California, especially the southern part of the State. Los Angeles reported a monthly total of 12.42 inches, which was the second greatest February total of record and the fourth greatest for any month in 64 years. The winter total at Los Angeles for this year was 20.13 inches, exceeded only in the winter of 1889-90 with a 3-month fall of 24.99 inches. The winter total for the entire State was 22.59 inches, the wettest winter in 25 years.

In the remainder of the country, precipitation was well below normal, except in Florida where it was above normal. In the East-Central States the precipitation was decidedly deficient and river stages were unusually low. Indiana and Tennessee had the driest February of record; Kentucky and Ohio, the driest since 1895; other States such as Pennsylvania, West Virginia, Virginia, and Missouri had the driest in 20 to 40 years. In contrast to California, the precipitation in Oregon was below normal and Washington had the driest February since 1920.

North Atlantic drainage.—Unusually heavy rains occurred on February 7 in the Northeast Coastal States, the heaviest amounts being confined to extreme southeastern New York and western Connecticut. Amounts recorded at regular Weather Bureau stations for the 24 hours ending at 7:30 a. m. of the 8th were 3.07 inches at New York City and 1.90 inches at Hartford, Conn. Greater amounts undoubtedly fell in this area but such records are not available at this time. Severe local flooding resulted from this rain in the smaller streams of western Connecticut.

The average snow depth over the Connecticut River Basin as of March 15-16 was 15.1 inches with an average water content of 4.14 inches.

Precipitation was frequent but rather light in amount in the Susquehanna River Basin, the average being below normal for the month. At the end of the month the snow depth in the basin above Towanda, Pa., averaged 5.2 inches with a water content of 1.25 inches. In the basin below Towanda the average snow depth as measured on March 4 was two inches. High temperatures with rain over most of the watershed on March 3 reduced the snow